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10/611,574	07/01/2003	Franco D'Alessandro	ERICP0343US	5171

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EXAMINER

WILLOUGHBY, TERRENCE RONIQUÉ

ART UNIT	PAPER NUMBER
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2836

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/611,574	Applicant(s) D'ALESSANDRO, FRANCO	
	Examiner Terrence R. Willoughby	Art Unit 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/23/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant amendment filed on January 23, 2006 has been entered. Accordingly claims 3 and 20 have been amended and no claims have been cancelled. No new claims were added. It also included remarks/arguments.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2,5-10,15-17,20,27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable by Gumley (US 6,320,119) and in view of Rapp (US 6,649,825).

With respect to claim 1, Gumley discloses the claimed lighting protection device (Fig 2) comprising: a grounded central rod (Fig. 2, elements 21 and 22) a conductive tip (Fig. 3, element 34) coupled to the central rod; a curved conductive shell (Fig. 2, element 24) capacitively spaced from the tip and the central rod, with an annular gap (Fig. 2, element 32) between the conductive shell and the tip that functions as a spark gap; and an electrical connection (Fig. 2, elements 42 and 43) joining the conductive shell to ground. Gumley discloses that conductive tips impart different electrical characteristics to the lighting protection device (column 2, ll. 39-column 3, ll. 1-9). Gumley lacks the claimed said device wherein the conductive tip is one of a set of tips that may be coupled to the tip mount of the central rod.

However, Rapp discloses a lightning protection system with a lightning rod and a conductive tip, which is one of a set of tips (Fig. 1- 5, elements 5) that may coupled to a tip mount (Fig. 1, element 6) of the central rod (Fig. 1-5, elements 3 and 3/9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a set of conductive tips coupled to the tip amount of the central rod taught by Rapp to the lighting protection device of Gumley to provide a safer lightening protection system by installing less pointed conductive tips.

With respect to claim 2, Gumley in view of Rapp discloses the claimed said device of claim 1. Rapp discloses that the set of tips (Fig. 1- 5 elements 5) includes tips with free ends opposite ends for coupling to the tip mount (Fig. 1, element 6). Gumley discloses that conductive tips impart different electrical characteristics (column 2, ll. 39-column 3, ll. 1-9) and that conductive tips have different radii of curvature (column 7, ll. 56-column 8, ll. 1-43). The different radii of curvature will necessarily change the electrical characteristics based on the radius and diameter of the conductive tip.

With respect to claim 5, Gumley in view of Rapp discloses the claimed said device of claim 2. Rapp discloses the free end is a set of tips (Fig. 1-5, elements 5). Gumley discloses that conductive tips have different radii of curvature (column 7, ll. 56-column 8, ll. 1-43).

With respect to claim 6, Gumley in view of Rapp teaches the claimed said device of claim 1. Rapp discloses that the set of tips (Fig. 1-5 elements 5) is coupled to the tip mount (Fig. 1, element 6). Gumley discloses that conductive tips have different diameters (column 2, ll. 39-column 3, ll. 1-9), which would thereby produce annular gaps

of different widths when coupled to the tip mount. It is well known in the art that conductive tips with different radii of curvature necessarily provide different air gap between the curved conductive shell and the central rod connected to ground.

With respect to claim 7, Gumley in view of Rapp discloses the claimed said device of claim 6. Rapp discloses the set of tips (Fig. 1-5, elements 5). Gumley discloses that conductive tips have different diameters (column 2, ll. 39-column 3, ll. 1-9).

With respect to claim 8, Gumley in view of Rapp discloses the claimed said device of claim 6. Rapp discloses that the set of tips (Fig. 1- 5 elements 5) includes tips with free ends opposite ends for coupling to the tip mount (Fig. 1, element 6). Gumley discloses that conductive tips have different radii of curvature (column 7, ll. 56-column 8, ll. 1-43).

With respect to claim 9, Gumley in view of Rapp discloses the claimed said device of claim 8. Rapp discloses the set of tips (Fig. 1-5, elements 5). Gumley discloses that conductive tips have unique diameter-radii combinations, wherein the tip has a unique radius of curvature (column 7, ll. 56-column 8, ll. 1-43); and wherein each of the tips has a unique diameter (column 2, ll. 39-column 3, ll. 1-9).

With respect to claim 10, Gumley in view of Rapp discloses the claimed said device of claim 1. Gumley discloses the electrical connection (Fig. 2, elements 42 and 43) is a connection between the conductive shell (Fig. 2, element 24) and the central rod (Fig. 2, element 21).

With respect to claim 15, Gumley in view of Rapp discloses the claimed said device of claim 1. Gumley discloses the shell has an oblate spheroidal (column 7, ll. 6-10) shape.

With respect to claim 16, Gumley in view of Rapp discloses the claimed said device of claim 16. Gumley discloses the claimed said device wherein the shell is an upper half (column 7, ll. 62-65) of an oblate spheroid.

With respect to claim 17, Gumley in view of Rapp discloses the claimed said device of claim 15. Gumley discloses a shell (column 12, ll. 10-11), but does not disclose the shell having a height of from 0.25 to 0.5 times a diameter of the shell. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use these chosen values based on the dimension and shape of the structure on which the lighting device is installed since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 102 USPQ 233.

With respect to claim 20, Gumley in view of Rapp discloses the claimed said device of claim 1. Gumley further discloses an insulating support (Fig. 2, 25) connected to both conductive shell (Fig. 2, element 24) and the central rod (Fig. 2, element 21).

With respect to claim 27, Gumley in view of Rapp discloses claimed said method of lightning protection using a lightning protection device, comprising: controlling electric field distribution characteristics in the vicinity of the device; and controlling spark production characteristics of the device, wherein the controlling the spark production characteristics includes: controlling width of a spark gap between a central grounded

rod of the device and a conductive shell of the device; and providing an electrical connection between the central grounded rod and conductive shell.

With respect to claim 28, Gumley in view of Rapp discloses the claimed said method of claim 27, wherein the controlling the electrical field characteristics includes selecting a tip for coupling to a tip amount of the central rod, from a tip set including a plurality of tips; and wherein at least some of the plurality of tips include tips with different radii of curvature at free ends of the tips.

With respect to claim 29, Gumley in view of Rapp discloses the claimed method of claim 28, wherein the controlling the width of the spark gap includes selecting a tip for coupling to a tip mount (Rapp Fig. 1, element 6) of the central rod (Rapp Fig. 1, element 3 and 3/9). Rapp discloses a set of tips, which include tips with different diameters coupled to the tip mount (Fig. 1, element 6). It is well known in the art that conductive tips with different radii of curvature necessarily provide different air gap between the curved conductive shell and the central rod connected to ground.

With respect to claim 30, please see the recited method for rejection as mentioned above in claim 29.

With respect to claim 31, Gumley in view of Rapp discloses the claimed said method of claim 30, wherein each of the plurality of tips (Rapp Fig. 1 element 5) has a unique combination of radius of curvature and diameter.

With respect to claim 32, Gumley in view of Rapp discloses the claimed said method of claim 31, wherein the selecting the tip includes selecting a tip based on a

height of a structure to which the lighting protection device is coupled (Gumley, column 8, ll. 1-3).

3. Claims 3,4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumley (US 6,320,119) and in view of Rapp (US 6,649,825) and further in view of Gumley (US 4,760,213).

With respect to claim 3, Gumley (US 6,320,119) in view of Rapp discloses the claimed said device of claim 2. Gumley discloses a conductive tip, wherein at least one of the tips has a free end with a generally conical shape (Fig.3, 34) surrounded by a curved conductive shell (Fig. 2, 24). Rapp discloses that the set of tips (Fig. 1- 5 elements 5) with free ends coupled to the tip mount (Fig. 1,element 6). Both Gumley (US 6,320,119) and Rapp do not explicitly disclose the claimed said free end is a protruding end that protrudes from the curved conductive shell.

However, Gumley (US 4,760,213) discloses (Figs. 1&8) a free end tip (13 and 52) is a protruding free end tip that protrudes from a curved conductive shell (14). See column 4, ll. 41-47. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Gumley (US 6,320,119) and Rapp protection device with the protruding free end tips of Gumley (US 4,760,213) to provide an improved lightning protection device that intercepts the approaching downward leader and attracts the lightning discharge to a preferred location, such as at earth potential or the grounded rod.

With respect to claim 4, Gumley in view of Rapp discloses the claimed said device of claim 3. Gumley discloses another tip, which has a free end with a generally hemispherical shape (Fig. 1, 18).

4. Claims 11-14, 22-26, 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumley (US 6,320,119) and Rapp (US 6,649,825) and in further view of Ruckman (US 4,571,656).

With respect to claim 11, Gumley and in view of Rapp discloses the claimed said device of claim 10. Gumley discloses the electrical connection (Fig. 2, 42 and 43 and column 4, ll. 9-19). Both Gumley and Rapp lack a variable impedance unit.

However, Ruckman discloses (Fig. 2) an electrical circuit for protection against surge overvoltage of transients including a variable impedance unit (24, 26, 28, 30 and column 2, ll. 50-54) connected between the input (12, 14) and output terminals (16, 18). It is well known in the art at the time the invention was made that a varistor, such as metal oxide varistor (MOV), or zener diode or transorb which are art recognized in the art as suitable for the intended purpose of providing a variable impedance. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to provide a variable impedance (resistor) taught by Ruckman inside the electrical connection, which is connected between the conductive shell and the grounded rod of Gumley to prevent excessive buildup of voltage across the resistors and to ensure rapid protection due to incoming transient impulses such as lightning strikes.

With respect to claim 12, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said device of claim 11. Ruckman discloses the impedance

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(resistance) of the variable impedance unit connected between the input (12,14) and output terminal (16,18) of an electrical circuit. Gumley in view of Rapp discloses the high impedance (resistance) connected between the conductive shell (Fig. 2, element 24) and the central rod (Fig. 2, elements 21 and 22).

With respect to claim 13, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said device of claim 12, wherein impedance decreases at at least one point as the voltage difference increases. It is well known in the art at the time the invention was made that a varistor, such as metal oxide varistor (MOV), or zener diode or transorb which are art recongnized as suitable for the intended purpose of providing a variable impendence and may be used to meaure the impedance at a given threshold or fixed point where the voltage difference increases.

With respect to claim 14, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said device of claim 13. Gumley discloses the electrical connection includes a resistor in parallel with a capacitor discharge circuit (column 4, ll. 20-26). Gumley lacks the claimed said transorb in parallel with a resistor.

However, Ruckman discloses (Fig. 2) an electrical circuit for protection against surge overvoltage of transients including a variable impedance unit (24,26,28,30 and column 2, ll. 50-54) connected between the input (12,14) and output terminals (16,18). It is well known in the art at the time the invention was made that a varistor, such as metal oxide varistor (MOV), or zener diode or transorb which are art recongnized in the art as suitable for the intended purpose of providing a variable impendence. It would have been obvious to one of the ordinary skill in the art at the time the invention was made to

provide a variable impedance (resistor) taught by Ruckman inside the electrical connection, which is connected between the conductive shell and the grounded rod of Gumley to prevent excessive buildup of voltage across the resistors and to ensure rapid protection due to incoming transient impulses such as lightning strikes.

With respect to claim 22, Gumley discloses the claimed lightning protection device (Fig. 2) comprising: a grounded central rod (Fig. 2, elements 21 and 22); a conductive tip (Fig. 3, element 34) coupled to the central rod; a curved conductive shell (Fig. 2, element 24) capacitively spaced from the tip and the central rod, with an annular gap (Fig. 2, element 32) between the conductive shell and the tip that functions as a spark gap (column 4, ll. 4-15); and an electrical connection (Fig. 2, elements 42 and 43) between the conductive shell (Fig. 2, element 24) and the central rod (Fig. 2, element 21). Gumley discloses the claimed said device wherein the tips impart different electrical characteristics to the lightning protection device (column 2, ll. 39-column 3, and ll. 1-9). Gumley lacks the claimed said device wherein the conductive tip is one of a set of tips that may be coupled to the tip mount of the central rod.

However, Rapp discloses the claimed said conductive tip is one of a set of tips (Fig. 1-5, elements 5) that may be coupled to the tip mount (Fig. 1, element 6) of the central rod (Fig. 1-5, elements 3 and 3/9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a set of conductive tips coupled to the tip mount of the central rod taught by Rapp to the lightning protection device of Gumley to provide a safer lightning protection system by

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installing less pointed conductive tips. Both Gumley and Rapp do not teach providing a variable impedance unit in the electrical connection.

However, Ruckman discloses (Fig. 2) an electrical circuit for protection against surge overvoltage of transients including a variable impedance unit (24,26,28,30 and column 2, ll. 50-54) connected between the input (12,14) and output terminals (16,18). It is well known in the art at the time the invention was made that a varistor, such as metal oxide varistor (MOV), or zener diode or transorb which are art recognized in the art as suitable for the intended purpose of providing a variable impedance. It would have been obvious to provide a variable impedance (resistor) unit taught by Ruckman inside the electrical connection, which is connected between the conductive shell and the grounded rod of Gumley and Rapp to prevent excessive buildup of voltage across the resistors and to ensure rapid protection due to incoming transient impulses such as lightning strikes.

With respect to claim 23, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said device of claim 22, wherein the impedance (resistance) of the variable impedance unit is a function of a voltage difference between the conductive shell and the central rod.

With respect to claim 24, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said device of claim 23, wherein the impedance decreased at at least one point as the voltage difference increases. It is well known in the art at the time the invention was made that a varistor, such as metal oxide varistor (MOV), or zener diode or transorb which are art recognized as suitable for the intended purpose

of providing a variable impedance and may be used to measure the impedance at a given threshold or fixed point where the voltage difference increases.

With respect to claim 25, the configuration of Gumley in view of Rapp and further in view of Ruckman would provide an impedance which decreases in a stepwise manner at at least one value of the voltage difference.

With respect to claim 26, please see the recited claim for rejection as mentioned above in claim 14.

With respect to claim 33, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said method of claim 27, wherein the providing the electrical connection includes providing a variable resistance (impedance) electrical connection.

With respect to claim 34, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said method of claim 33, wherein providing a variable resistance electrical connection includes providing a variable resistance electrical connection; and wherein resistance of the variable resistance electrical connection is a non-constant function of a voltage difference between the shell and the central rod.

With respect to claim 35, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said method of 34, wherein the resistance decreases as the voltage difference increases.

With respect to claim 36, Gumley in view of Rapp and further in view of Ruckman discloses the claimed said method of 35, wherein the resistance decreases as the voltage difference increases.

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5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gumley (US 6,320,119) and in view of Rapp (US 6,649,825) and in further view of Mansfield et al. (US 5,652,690).

With respect to claim 21, Gumley and Rapp discloses the claimed said device in claim 20. Both references lack the claimed said vented support.

However, Mansfield et al. discloses using vented supports (column 1, ll. 25-28). It would have been obvious to one of the ordinary skilled in the art at the time the invention was made to use a vented support assembly taught by Mansfield et al. to allow hazardous gases from escaping the interior of the lighting device taught by Gumley and Rapp.

6. Claims 18, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gumley (US 6,320,119) in view of Rapp (US 6,649,825) and in further view of Gumley (WO 94/17578).

With respect to claim 18, Gumley (US 6,320,119) in view of Rapp discloses the claimed said device of claim 1. Both of the references lack the claimed said shell is a stainless steel shell.

However, Gumley (WO 94/17578) discloses a lightening protection device with a stainless steel shell (page 5, ll. 12-13 and ll. 19-20). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a durable material such as stainless steel as taught by Gumley (WO 94/17578) to withstand the impact of a lighting strike.

With respect to claim 19, Gumley (US 6,320,119) in view of Rapp and further in view of Gumley (WO 94/17578) discloses the claimed invention as mentioned above in claim 18, except for the stainless shell having a thickness of at least about 3mm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a thickness of at least 3mm such to withstand the impact of a lightning strike, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Böesch, 617 F.2c 272, 205 USPQ 215 (CCPA 1980).

Response to Amendment

7. Claims 1-2,5-10,15-17,20, and 27-32 are rejected under Gumley (US 6,320,119) and Rapp (6,649,825).

With respect to applicant arguments and claims 1-2,5,8, and 28 Gumley discloses that different conductive (sharp, blunt, flat) tips impart different electrical characteristics (radius or diameter dimension) to the lightning protection device (column 2, ll. 39-column 3, ll. 1-9). Rapp discloses a lightning rod system with a rod and a conductive tip, which is one of a set of tips (Fig. 1- 5, elements 5) that may coupled to a tip mount (Fig. 1, element 6) of the central rod (Fig. 1-5, elements 3 and 3/9). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a set of conductive tips coupled to the tip amount of the central rod taught by Rapp to the lightning protection device of Gumley to provide a safer lightening protection system by installing less pointed conductive tips.

The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. MPEP 2144.

Although Ex art Levengood, 28 USPQ2d 1300, 1302 (Bd. Pat. App. & Inter. 1993) states that obviousness cannot be established by combining references "without also providing evidence of the motivation force which would impel one skilled in the art to do what the patent applicant has done" (emphasis added), reading the quotation in context it is clear that while there must be motivation to make the claimed invention, there is no requirement that the prior art provide the same reason as the applicant to make the claimed invention.

With respect to applicant's arguments and claims 6,9, 28-32, Gumley discloses that conductive tips have different diameters (column 2, ll. 39-column 3, ll. 1-9) and that a number of parameters such as the size of the air gap and the shape of the tip of the central grounded conductor (column 3, ll. 46-50) affect the triggering of the corona which is controlled by the size of the spark gap (column 5, ll. 12-17). Gumley also discloses varying the spark gap width (column 10, ll. 65-column 11, ll. 1-13).

Applicant's arguments with respect to claims 3-4, 11-14, 22-26, and 33-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrence R. Willoughby whose telephone number is 571-272-2725. The examiner can normally be reached on 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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